

DESIGN AND DEVELOPMENT OF A
GENERIC ARCHITECTURE FOR APPAREL MANUFACTURING :

~~Volume 9~~: Executive Summary Technical Report

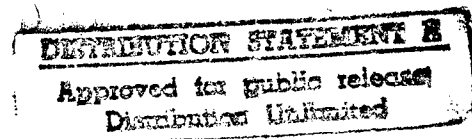
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Reported by:

Dr. Sundaresan Jayaraman
Principal Investigator



Georgia Tech Project #: E-27-628

Georgia Institute of Technology
School of Textile & Fiber Engineering
Atlanta, Georgia 30332

Tel: 404/894-2490
Fax: 404/894-8780

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13. ABSTRACT (Maximum 200 words) Research has been carried out to design and develop a generic architecture for an apparel enterprise that can serve as a blueprint for a computer-integrated apparel enterprise (CIAE). The Apparel Manufacturing Architecture (AMA) -- the first comprehensive architecture for manufacturing -- has been developed and validated in close collaboration with the apparel industry. AMA consists of a set of models the core of which is the <i>information</i> model which defines the schema of the shared information base for an apparel enterprise. The <i>function</i> model component of the architecture specifies how the activities carried out in an apparel manufacturing enterprise interact with each other through the shared information base. The third component of AMA, the <i>dynamics</i> model, describes how the interactions among the enterprise activities take place over time. The Recruit Induction Center Architecture (RICA) models the uniform distribution process at the Recruit Induction Center (RIC). The Executive Summary documents the overall summary of the research accomplishments ⁱⁿ Vols. 1-6.					
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Research Project Personnel

Harinarayanan Balakrishnan

Aruna Cidambi

Rajeev Malhotra

Annajee Rao Nott

Rangaswamy Rajamanickam

M. C. Ramesh

K. Srinivasan

Yin Zhou

Graduate Research Assistants

Dr. Sundaresan Jayaraman

Principal Investigator

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Executive Summary

The Final Technical Report for the project entitled "Design and Development of a Generic Architecture for Apparel Manufacturing" is being submitted in seven volumes. The scope of the individual volumes is as follows:

- | | |
|------------|---|
| Volume 0 | Executive Summary Technical Report (This Volume)
[SJ-TR-ARCH-9603] |
| Volume I | AMA Primer
[SJ-TR-ARCH-9412] |
| Volume II | Apparel Manufacturing Architecture: The Function Model
[SJ-TR-ARCH-9412] |
| Volume III | Apparel Manufacturing Architecture: The Information Model
[SJ-TR-ARCH-9412] |
| Volume IV | Recruit Induction Center Architecture: Function and Information Models for the Uniform Distribution Process
[SJ-TR-ARCH-9411] |
| Volume V | Research Methodology
[SJ-TR-ARCH-9603A] |
| Volume VI | Additional Reports and Papers
[SJ-TR-ARCH-9603B] |

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1. Introduction

To stay competitive in the global marketplace, the textile-apparel industrial complex must evaluate and deploy state-of-the-art manufacturing and information technologies. The vitality of this complex is especially critical to the US Department of Defense (DoD) which relies on this industrial base to clothe its personnel and maintain a state of readiness. To enable the apparel industry to become competitive by adopting advanced techniques and tools, the US Defense Logistics Agency (DLA) sponsored the development of a generic architecture for apparel manufacturing at Georgia Tech. Such a comprehensive architecture encompassing the function, information and dynamics facets of an enterprise is a prerequisite for the implementation of advanced technologies including computer-integrated manufacturing (CIM) in the apparel enterprise.

2. Research Objectives

The primary objective of this research effort has been to design and develop a generic architecture for an apparel enterprise in cooperation with apparel companies. Yet another objective has been to develop an architecture (model) for the uniform issuance process at recruit induction centers (RICs). The third major objective has been to work with appropriate industry groups to promote the use of the architecture and related concepts.

3. Research Accomplishments

The major research accomplishments are summarized in this section. Separate volumes are dedicated to each of the accomplishments.

Apparel Manufacturing Architecture (AMA): The apparel manufacturing architecture (AMA) is a comprehensive set of specifications for a computer-integrated apparel enterprise (CIAE). AMA consists of a set of models the core of which is the *information* model which defines the schema of the shared information base for an apparel enterprise. The *function* model component of the architecture specifies how the activities carried out in an apparel manufacturing enterprise interact with each other through the shared information base. The third component of AMA, the *dynamics* model, describes how the interactions among the enterprise activities take place over time. The USAF's IDEF Methodology was used in the development of AMA. It was developed in cooperation with major apparel manufacturers and a few member companies of the American Apparel Manufacturers Association (AAMA). AMA can thus play a significant role in the development and implementation of information exchange standards in the apparel industry.

Recruit Induction Center Architecture: The recruit induction center architecture (RICA) consists of the function and information models of the uniform distribution process at RICs. RICA has been developed based on visits to major RICs by members of the DoD Joint Working Group and Georgia Tech. This architecture, in conjunction with AMA, will facilitate the implementation of customer-driven uniform manufacturing (CDUM) for clothing the recruits.

Interaction with Industry Groups: Several major initiatives were conducted in collaboration with industry groups to promote AMA and related concepts. These include:

1. participation in the Agility Forum's Enterprise Integration Focus Group that led to the creation and publication of the document Key Need Areas for Integrating the Agile Virtual Enterprise, AR94-04 in October 1994;
2. conducting workshops with Small and Medium Size Enterprises (SMEs);
3. participation in the NATO Advanced Study Institute on Mechatronics in Textile Engineering in Side, Turkey;
4. extensive interaction with the apparel industry through the American Apparel Manufacturers Association's Apparel Research Committee, CIM Committee, and Management Systems Committee;
5. dissemination of information on AMA through presentations at industry meetings and conferences including the Bobbin Show, trade and refereed publications and distribution of copies of AMA.

Additional Key Accomplishments: In addition to realizing the original objectives of the project, this research has led to the following major accomplishments:

1. development of a new modeling methodology IFEM (Integrated Framework for

Enterprise Modeling) that overcame the major drawbacks of the IDEF methodologies;

2. development of the Enterprise Modeling Framework (EMF) that provides an environment for seamlessly moving between the function, information and dynamics facets of an enterprise;
3. an AMA-based information system for an apparel enterprise implemented in Paradox, a relational database tool;
4. a Toolbook-based multimedia system for showcasing the connectivity between the various DLA-AAMTD Projects in the context of AMA;
5. AMA has more recently been serving as the *integrating* framework for the newly initiated Apparel Research Network (ARN) Program at DLA.

4. Conclusions

In conclusion, the research effort has realized the vision of creating a generic architecture for apparel manufacturing and has made pioneering contributions to advance the field of enterprise modeling while conclusively demonstrating the importance of an enterprise architecture for process reengineering and the effective implementation of information systems and technologies in the manufacturing enterprise.

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